



US006809444B1

(12) **United States Patent**
Gieseke

(10) **Patent No.:** **US 6,809,444 B1**
(45) **Date of Patent:** **Oct. 26, 2004**

(54) **FREE ROTATING INTEGRATED MOTOR
PROPULSOR**

(75) Inventor: **Thomas J. Gieseke**, Newport, RI (US)

(73) Assignee: **The United States of America as
represented by the Secretary of the
Navy**, Washington, DC (US)

(*) Notice: Subject to any disclaimer, the term of this
patent is extended or adjusted under 35
U.S.C. 154(b) by 0 days.

(21) Appl. No.: **10/679,681**

(22) Filed: **Oct. 6, 2003**

(51) **Int. Cl.**⁷ **B63H 21/17; H02K 5/132**

(52) **U.S. Cl.** **310/87; 310/67 R; 440/6**

(58) **Field of Search** 310/87, 112-114,
310/67 R; 440/6; 114/337-338

(56) **References Cited**

U.S. PATENT DOCUMENTS

3,143,972 A * 8/1964 Smith et al. 417/356
4,648,345 A * 3/1987 Wham et al. 114/338

4,831,297 A * 5/1989 Taylor et al. 310/87
5,078,628 A * 1/1992 Garis, Jr. 440/6
5,289,068 A * 2/1994 Veronesi et al. 310/114
5,408,155 A * 4/1995 Dickinson et al. 310/90
5,607,329 A * 3/1997 Cho et al. 440/6
5,702,273 A * 12/1997 Cho et al. 440/6
5,941,744 A * 8/1999 Levedahl 440/6
6,015,272 A * 1/2000 Antaki et al. 417/356

* cited by examiner

Primary Examiner—Burton Mullins

(74) *Attorney, Agent, or Firm*—James M. Kasischke;
Michael F. Oglo; Jean-Paul A. Nasser

(57) **ABSTRACT**

An integrated motor propulsor includes a rotor which a plurality of rotor blades adapted to rotate about a center axis. An outer ring surrounding the rotor contacts one of the rotor blades and has a field means positioned on the outer ring. A duct is in low friction contact circumferentially outside the outer ring. A stator is positioned in the duct to interact with the field means. The duct also has a plurality of pitch control apparatuses pivotally joined to outboard blades which extend radially outward from the duct.

11 Claims, 1 Drawing Sheet

